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NEW ENGLAND ZOÖLOGICAL CLUB

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TWENTY-FIVE NEW SPHINGIDAE

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THE sphingid forms described in the following pages comprise thirteen new species and twelve new subspecies. They are from widely scattered localities. Seven are from South America, five from China, five from Polynesia, two from the Philippines, and one each from the Caucasus, North America, the West Indies, Africa, Australia and the Fiji Islands.

My collection now has reached a total of eleven hundred and twenty-five species and subspecies, represented by some seventy-two hundred specimens. As the total number of species and subspecies of Sphingidae known to science is about thirteen hundred, it is my hope and ambition eventually to gather together a complete collection of this remarkable family, containing every known form. So far as I have been able to learn, such a task never has been accomplished in any large family of living creatures. Yet I have good reason to believe that, though by my own efforts I never could attain this goal, I shall be enabled to do so by the active coöperation of men of science the world over, which has already brought me so far along the road. For this assistance I wish to give my hearty thanks to men too numerous to mention, but whose help I deeply appreciate.

Two corrections I wish to make in my own past work, and one note on the work of another.

*Orecta fruhstorferi* Clark was described in these Proceedings, Vol. VI, p. 45, pl. V, fig. 4. On page 99 of the same volume I expressed a doubt as to its validity. Now, with a full series of *O. lycidas cos* before me, and a male and a female of *O. lycidas lycidas*, I feel confident that *O. fruhstorferi* is a valid species.

*Poliodes senegalensis* Clark was described in Volume VII, page 69, of the Proceedings. My friend Mr. Andrey N. Avinoff has called to my attention the fact that this species should be placed in the genus *Polyptychus*. It should stand as *Polyptychus senegalensis* Clark.

Having recently received in exchange from the Berlin Museum a cotype of *Polyptychus inconspicuus* Strand, a female, I have compared it with a female of *Polyptychus hollandi* R. & J., so designated by Dr. Karl Jordan. It is my belief that the two forms are identical, and that *P. inconspicuus* should be considered a synonym of *P. hollandi*.

#### ***Herse convolvuli peitaihoensis* subsp. nov.**

Al. ant. long., ♂, 36 mm.; ♀, 37 mm. Al. ant. lat., ♂, 14 mm.; ♀, 15 mm. Marg. ext., ♂, 19 mm.; ♀, 20 mm.

*Habitat.* — Pei-tai-ho, northern China. One male and one female in coll. B. Preston Clark, received from Dr. O. Staudinger and A. Bang-Haas.

This form differs from all the specimens of *H. convolvuli* which I have had the opportunity of examining, in that it does not show the tendency to dimorphism so general in *H. convolvuli*, in which the markings of the male are distinct, while the female tends to a more uniform gray tone.

In *peitaihoensis* both sexes uniformly have throughout a brightly white appearance in their ground tone, and because of this fact both have a highly variegated appearance. This uniformity of coloration in the two sexes and the highly varie-

gated character of the coloration seem to be of sufficient importance to deserve a subspecific description.

*Herse convolvuli marshallensis* subsp. nov.

Al. ant. long., ♂, 32 mm.; ♀, 31 mm. Al. ant. lat., ♂, 12 mm.; ♀, 11.5 mm. Marg. ext., ♂, 17 mm.; ♀, 16 mm.

*Habitat.* — Taluit, Marshall Islands. One male and one female in coll. B. Preston Clark, received in exchange from the Berlin Museum, where there remains a series.

This form was mentioned by Dr. Karl Jordan in 1903, in the 'Revision of the Sphingidae' (pp. 14, 15), but he did not at that time feel it wise to give it a name. On comparison with a long series of *H. convolvuli*, from many localities, insular and continental, it appears to stand as a distinct race, and to merit a name.

Male: Head, thorax, and abdomen above and below, yellow irrorated with brown. Abdominal tergites faintly pink. Fore wing above, ground tone yellow, against which the black markings stand out sharply. Hind wing above, uniformly light yellow, with the transverse bands, and the sub-basal band faintly indicated. Fore wing below, yellowish brown, unicolorous, with no markings. Hind wing below, light yellow, with one dark median transverse band; submarginal band lacking.

Female: Head, thorax, and abdomen above and below, light gray irrorated with white. Abdominal tergites faintly pink. Fore wing above, white irrorated with yellow, and with faint black markings. Hind wing above, white irrorated with light brown, and with the transverse bands and the sub-basal line faintly indicated. Fore wing below, unicolorous, faintly pink, irrorated with brown. Hind wing below, of same color as the under side of the fore wing, save for a distal marginal band of slightly darker tint, the brown irroration being heavier.

This form is nearer to a form from Aksu, Chinese Turkestan, than to any other specimens of *H. convolvuli* to which I have had access, but in *marshallensis* the male is much yellower, and the female far whiter than in the Aksu form.

*Cocytius macasensis* sp. nov.

Al. ant. long., ♂, 67 mm. Al. ant. lat., ♂, 26 mm. Marg. ext., ♂, 33 mm.

*Habitat.* — Macas, Ecuador. One male in coll. B. Preston Clark, received from Dr. O. Staudinger and A. Bang-Haas.

In general appearance distinct from any other known *Cocytius*. Most nearly allied to *C. duponchel* and *C. lucifer*. Its general coloration is seal-brown, with lighter markings.

Antennae brown above, white beneath. Palpus light yellow at base. Second and third segments rich reddish brown. Head, thorax and abdomen above, seal-brown. Mesothoracic tegulae rich reddish brown, tipped with lighter brown. Legs seal-brown, with light markings. Side tufts at base of abdomen prominent, white; abdomen with three yellow side spots, light yellow beneath, except anal tip, which is seal-brown. Hind wing with transparent discal interspaces; transparent areas not indented between the veins.

Fore wing above, seal-brown, unicolorous. The usual generic markings all indistinct, due to the dark color of the wing. Black streaks R3-M2 not prominent, but clearly defined. Postmedially and costally of veins SC5 to M2 inclusive, are long vinaceous brown markings extending to the distal margin; these are the most prominent characteristic of the species. A prominent yellow dumb-bell-shaped stigma at apex of cell, with an inconspicuous stigma of the same color distant from it 4 mm. apically and costally. Hinder angle produced as in *C. lucifer*. Fringe yellow, dark at the veins. Hind wing above, dark seal-brown, yellow basally as in *C. lucifer*; transparent discal interspaces small; fringe yellow, dark at the veins.

Fore wing below, natal brown; a yellow streak extends along the costal margin sub-basally some distance toward the wing apex; a yellow patch in the fork between M1 and M2, and another between M2 and the inner margin, basally of the first patch; fringe as on upper side. Hind wing below, natal brown with yellow basal area similar to that on the upper side of the wing.

*Protoparce viola-alba* sp. nov.

Al. ant. long., ♀, 39 mm. Al. ant. lat., ♀, 15 mm. Marg. ext., ♀, 21 mm.

*Habitat.* — Corumba, Matto Grosso, western Brazil. One female in coll. B. Preston Clark, received from Dr. O. Staudinger and A. Bang-Haas.

The two outstanding characteristics of this species are that the fore wing is of almost exactly the shade of dull violet that marks *Isognathus caricae*, while the hind wing has the pure white color of *P. manducoides*, to which latter this species is most closely allied.

Antennae and palpus dark brown. Occiput, thorax and abdomen above, dark brown irrorated with dull violet. Four prominent rectangular yellow side patches on abdominal tergites, on segments one to four inclusive. White side patch on fifth abdominal tergite. Breast dark brown. Abdomen beneath, white irrorated with yellow. Side tufts yellow.

Fore wing above: Dull violet, of same tint as fore wing of *I. caricae*, but slightly darker. Unicolorous, save for the following markings. Four transverse dark brown lines — line one, sub-basal, extends from a point 7 mm. from the wing base on costal margin sharply toward the hinder angle a distance of 4.5 mm., from this point sharply angled basad it extends to the inner margin, which it reaches at a point 5 mm. from the base; line two, antemedian, extends from a point on costal margin 12 mm. from the wing base to a point on inner margin 10 mm. from the base, curving distad until it reaches M1, thence basad; line three, postmedian, extends from a point 16 mm. from the apex distad to R3, thence basad to inner margin, which it reaches 10 mm. from hinder angle (a dark dash 5 mm. in length crosses this line between R2 and M1); line four, submarginal, extends from a point on costal margin 10 mm. from apex distad until at R3 it is within 4 mm. of distal margin, whence it runs parallel to this margin, reaching the inner margin 5 mm. from hinder angle; all four lines are irregular in their outline, and angled on the veins. Dark brown submarginal patches on veins R2, R3, M1 and M2, about 2 mm. distant from distal margin. A dark brown apical line so characteristic of the genus *Protoparce* extends from the wing apex a distance of 10 mm., angled on SC5, and ending on R1, where it bisects transverse line four.

Hind wing above: Pure white, tinged with pink along anal margin, and with a dark brown distal marginal band, 4 mm. in width, which extends basad along the anal fold, and also is produced basad 1.5 mm. at the veins.

Fore wing below: Brown irrorated with dull violet. Unicolorous, save for a basal whitish area. Veins prominent.

Hind wing below: White basally and along anal margin, thence irrorated more and more heavily with brown to the distal and the inner margin. Veins prominent.

This is a beautiful and unusual form, and unlike any *Protoparce* with which I am familiar.

**Neogene corumbensis** sp. nov.

Al. ant. long., ♂, 23 mm.; ♀, 25 mm. Al. ant. lat., ♂, 9 mm.; ♀, 9.5 mm. Marg. ext., ♂, 12 mm.; ♀, 12.5 mm.

*Habitat.* — Corumba, Matto Grosso, western Brazil. Two males and two females in coll. B. Preston Clark, received from Dr. O. Staudinger and A. Bang-Haas.

This form has the white occipital band of *N. dynaeus*, but it is cream-colored, not brilliant white. The ground tone of both wings, above and beneath, is brown, where *N. dynaeus* is gray. The abdomen also is brown, where *N. dynaeus* is black. The hind wing of the male is not white, as in *N. dynaeus*, but is uniform brown above and beneath. The white markings of the fore wing above, so distinct in *N. dynaeus*, are in this form almost entirely lacking. It is a singularly unicolorous insect throughout.

**Coenotes maximus** sp. nov.

Al. ant. long., ♀, 38 mm. Al. ant. lat., ♀, 17 mm. Marg. ext., ♀, 21 mm.

*Habitat.* — Ceram. One female in coll. B. Preston Clark, received from Dr. O. Staudinger and A. Bang-Haas.

The entire insect is unicolorous and uniformly gray above and beneath except as follows. The abdomen above has a heavy black median line, and heavy black roughly triangular side patches on each segment, the points downward. On the fore wing above is an irregular apical line, 11 mm. in length, angled between SC4 and SC5, and between SC5 and R1. A broad gray postmedian band, darker in color than the general tone of the wing, extends across the wing, roughly parallel to the distal margin, and turns basad as it approaches the costal margin. A second similar band runs parallel to the first about midway between it and the distal margin. Cilia are dark at the veins on both wings above. There are no markings whatever on the under side of either wing, except an apical line 3 mm. in length and the darkened cilia at the veins. A very quiet-looking insect.

*Sphinx dolli australis* subsp. nov.

Al. ant. long., ♂, 27 mm. Al. ant. lat., ♂, 8 mm. Marg. ext., ♂, 13.5 mm.

*Habitat.* — Washington Mts., Arizona, thirty miles southeast of Nogales. Two males in coll. B. Preston Clark, collected by Mr. J. A. Kusche, July 17, 1919.

This subspecies is closely allied to *S. d. coloradus* and *S. d. dolli*, but is distinct from them both. It is nearest to *coloradus*. The entire insect is, however, darker in color than *coloradus*. The head and mesothorax are dark gray. Mesothoracic tegulae are dark brown with no white margins.

Fore wing above is gray in ground tone, with dark brown markings, in general similar to those of *S. d. coloradus*. A heavy dark brown line between SM2 and the inner margin, extends from a point 3 mm. from the base of the wing, parallel to the inner margin, and reaches a length of fully 6 mm. Hind wing above is unicolorous, and distinctly darker in tone than in *coloradus*. Fore wing and hind wing below are distinctly darker in tone than in *coloradus*.

Genitalian slides show the clasper more acuminate than in *S. d. dolli* and *S. d. coloradus*. The harpe is dentate only on the inner margin.

*Oxyambulyx subocellata chinensis* subsp. nov.

Al. ant. long., ♂, 37 mm.; ♀, 48 mm. Al. ant. lat., ♂, 15 mm.; ♀, 19 mm. Marg. ext., ♂, 22 mm.; ♀, 28 mm.

*Habitat.* — Canton, China. Two males and two females in coll. B. Preston Clark, received from Dr. O. Staudinger and A. Bang-Haas.

While in all essential respects they agree with typical *subocellata*, when these specimens are placed beside a typical series of the latter certain points of contrast come out sharply; these are especially noticeable in the male.

Fore wing above: Both sexes lack almost entirely the dark markings of *O. s. subocellata*. The various spots and bands are indicated by slightly darkened areas, but all carrying the same ground tone. The stigma, the apical line, and the line at the hinder angle alone are really dark-colored. The stigma is irrorated with white. Hind wing above: Similar in its markings to *subocellata*, but they are lighter in color.



Fore wing beneath: The postmedian markings are lacking, except the marginal distal band, and this approaches more nearly the color of the rest of the wing than in the typical form. Hind wing beneath: All markings are much lighter in color than in *subocellata*, and fainter.

### *Smerinthus planus alticola* subsp. nov.

Al. ant. long., ♂, 23 mm.; ♀, 26 mm. Al. ant. lat., ♂, 9.5 mm.; ♀, 10.5 mm. Marg. ext., ♂, 12 mm.; ♀, 13.5 mm.

*Habitat.* — Mount Pao-IIwa, near Lungtan, China. One male and one female in coll. B. Preston Clark, received from Dr. O. Staudinger and A. Bang-Haas.

This is a dwarf form, with pronounced characteristics.

Fore wing above, cinnamon-drab, the darker markings being wood-brown; the ground tone is lighter than in *S. p. planus*, and the markings are less distinct, giving a more unicolorous appearance. Hind wing above, cinnamon-drab, shading to wood-brown on distal margin; pink area more restricted than in the typical form, and less vivid in color.

Fore wing beneath, colored similarly to the upper side; pink basal area lighter in tone and more restricted in area than in *planus*. Hind wing beneath, markings faint, and ground tone lighter than in *planus*.

### *Isognathus rimosa wolcotti* subsp. nov.

Al. ant. long., ♂, 38 mm. Al. ant. lat., ♂, 14 mm. Marg. ext., ♂, 21 mm.

*Habitat.* — Rio Piedras, Porto Rico, West Indies. Two males in coll. B. Preston Clark, received from Mr. George N. Wolcott, and named after him.

This form is one of unusual interest. It is distinct from the Cuban form, *I. rimosa rimosa*, from the Haitian form, *I. rimosa molitor*, from the Jamaican form, *I. rimosa jamaicensis*, and from the continental form, *I. rimosa papayae*, while showing points of resemblance to each of them.



The strongest point of difference between this form and those from Cuba, Haiti and Jamaica, is the marginal band of the hind wing, which is about half as wide as in the other West Indian forms, and but slightly wider than in *papayae*. The ground tone of the fore wing is brown, as in *jamaicensis* and *rimosa*, differing in this regard sharply from the white of *molitor* and *papayae*. The broad light gray distal marginal band on the under side of both the fore and the hind wing, so marked in *molitor*, less so in *rimosa*, and lacking in *jamaicensis* and *papayae*, is very prominent in *wolcotti*.

The salient characteristic of *wolcotti* is its close approximation to *molitor*, *rimosa*, *jamaicensis* and *papayae*, in one particular in the case of each form. It is a link connecting the other subspecies, geographically and racially; and with them it makes a total of eight subspecies of *Isognathus rimosa*. Each is well marked, and the whole forms a remarkable group.

#### **Haemorrhagia fuciformis affinis f. nigra forma nov.**

Al. ant. long., ♂, 25 mm. Al. ant. lat., ♂, 8 mm. Marg. ext., ♂, 15 mm.

*Habitat.* — Mokanshan near Hangchow, China. Two males in coll. B. Preston Clark, received from Dr. O. Staudinger and A. Bang-Haas.

While the maculation of the body and wings of this form show it to be close to f. *alternata*, there are the following differences. Fore and hind wings both above and beneath are dead black, instead of the dark red of f. *alternata*. Thorax and posterior sternites are a deep orange instead of yellow. The black marginal distal band of the fore wing is much narrower in this form, being only 4 mm. in width at SC 5, and tapering to a width of 1 mm. at the hinder angle. The distal marginal band of the hind wing also is very narrow. There are no yellow hairs along the costal margin of fore wing, and they are sparse at the base of both fore and hind wing, contrasting in this respect with the large number in f. *alternata*.

*Pholus macasensis* sp. nov.

Al. ant. long., ♂, 58 mm. Al. ant. lat., ♂, 23 mm. Marg. ext., ♂, 31 mm.

*Habitat.* — Macas, Ecuador. One male in coll. B. Preston Clark, received from Dr. O. Staudinger and A. Bang-Haas.

Closely resembling *P. satellitia licaon* Cr., but a darker-colored insect, in both its ground tone and its markings.

The fore wing above lacks entirely the white or pink color along veins M1 and M2, so characteristic of *P. s. licaon*. The ground tone of the wing is isabella color, and the markings are bister. The dark rhomboidal area midway of the inner margin in *licaon*, is in this species narrow and nearly rectangular. The general appearance of the wing is highly variegated. The hind wing above shows no material difference from *licaon*, except an entire absence of any pink tinge at the anal angle.

It is on the under side of this insect that the strongest differences from *P. s. licaon* come out. The fore wing below has the basal half brown. The two light postmedian transverse lines of *licaon* are in this species heavy, with the posterior one deeply lunulate between the veins and the basal one fading away at SM2. The area between these two lines, which in *licaon* is nearly the same color as the rest of the wing, contains in this species three irregular dark lines, so close together as to give the appearance of a broad postmedian band 8 mm. in width and extending from the costal margin nearly to the inner margin. The distal marginal band of *licaon* widens to R3, where it attains a width of 9 mm.; it then narrows abruptly on R3, and continues still narrowed, and lunulate between the veins, to the hinder angle, where it is 5 mm. wide. The marginal band in this species widens from the wing apex to R2, where it is 10 mm. in width, and it retains very nearly this width to the hinder angle, where it is still 8 mm. broad. It is only slightly lunulate between the veins.

The hind wing below is brown in the basal half. The two postmedian transverse lines are heavy, as on the fore wing, containing between them the three irregular dark lines, the whole forming the same sort of dark band as on the fore wing, 9 mm. wide on the inner margin, and narrowing to 6 mm. anally. The basal line fades out anally, and the posterior line is strongly lunulate. The veins are dark between this broad band and the distal margin.

**Chromis erotus cramptoni** subsp. nov.

Al. ant. long., ♂, 34 mm.; ♀, 39 mm. Al. ant. lat., ♂, 12 mm.; ♀, 15 mm. Marg. ext., ♂, 20 mm.; ♀, 23 mm.

*Habitat.* — Agana, Guam. Twelve males and ten females in coll. B. Preston Clark, collected in July, 1920, by my friend Dr. Henry E. Cramp-ton, and presented to me by him. The form bears his name.

I have hesitated to separate this form in a species so widely distributed and so uniform in its characteristics, but the locality is so isolated, the characters of the race are so marked, and the series is so long and so unvarying, that such treatment seems advisable.

Fore wing above: Sub-basal line, 3 mm. in length, from costal margin toward inner margin. Antemedian line, concave basad, extends from a point 11 mm. from the base on costal margin to a black spot at the base on the inner margin. There are postmedian geminate transverse lines; the area between the lines is dark, on costal margin, and from inner margin to a point half-way to costal margin. A postmedian line parallel to the geminate one extends from a point 5 mm. distant from hinder angle to a point 10 mm. from wing apex on costal margin, curving basad as it approaches this margin. Dark shade posteriorly to this line, between it and distal margin, extends from R1 to R3. All these markings are sharp, and uniform throughout the whole series. Hind wing above shows no marked difference from the typical form.

Fore wing below: A heavy dark brown distal marginal band extends from the wing tip, broadening until between R2 and R3 it is 6 mm. in width, then narrowing irregularly to the hinder angle, where it is 2 mm. wide. This band is heavier in the male. The hind wing below has a similar distal marginal band, 2 mm. wide at the inner angle, and tapering to the anal angle.

**Acosmeryx miskini brooksi** subsp. nov.

Measurements identical with those of *A. miskini miskini* Murray.

*Habitat.* — Lebong-Tandai, Benkoelen District, Sumatra. One male in coll. B. Preston Clark, collected by my friend Mr. Cecil J. Brooks, and presented to me by him. I take pleasure in naming the form for him.

This subspecies follows closely the general coloration and maculation of typical *A. miskini*. There are certain differences which deserve subspecific recognition, and which indicate that this is the western form of *A. miskini*.

The stigma on the fore wing, instead of being light yellow and prominent, as is the case with typical *miskini*, is dark and inconspicuous, with but a tiny ocellus of dark yellow. The angle of the fore wing at SC5 is less prominent and less sharply angled than in *miskini*. The lunar apical area between the wing apex and SC5 is lighter in color and more prominent than in the typical form; so is the submarginal line extending diagonally from a point on SC5, 4 mm. from the distal margin, and reaching that margin between R3 and M1, and filling the entire space between these two veins. The dark broadly lunar shade, which in *miskini* extends along the distal margin from SC5 to a point between R2 and R3, in this form extends slightly but clearly beyond R3.

#### *Temnora nephele* sp. nov.

Al. ant. long., ♂, 21 mm.; ♀, 23 mm. Al. ant. lat., ♂, 9 mm.; ♀, 10 mm. Marg. ext., ♂, 11 mm.; ♀, 13 mm.

*Habitat.* — Efulan, Cameroons. One male and one female (type) in coll. B. Preston Clark, received in exchange from Dr. William J. Holland, and collected by Dr. H. L. Weber. One female also from Benito, Spanish Guinea, collected by Dr. Good.

Closely allied to *T. subapicalis* R. & J. Dr. Karl Jordan says "More gray, tip of fore wing less pointed."

Head, thorax and abdomen above, wood-brown. Abdomen beneath dull pink irrorated with brown.

Fore wing above, wood-brown, with the following markings of Prout's brown. A sub-basal band 1 mm. in width extending from inner to costal margin; a triangular patch with its base 5 mm. in width on costal margin, its posterior point 9 mm. distant from wing apex, and its apex on M2 2.5 mm. distant from hinder angle; a rectangular subapical patch on costal margin; and a series of vein dots extending posteriorly from this patch to hinder angle. Fringe white, dark at veins. Hind wing above, unicolorous, Prout's brown; fringe white, dark at the veins.

Fore wing below, basal half brownish black; discal area dull pink; a regular distal marginal brownish black band 2 mm. in width, and broadening to 4 mm. on R2.

Hind wing below, dull pink with three irregular faint lines, one median, and two postmedian, and all three parallel to distal margin; irregular brownish black distal marginal band 2 mm. wide at inner angle, and narrowing posteriorly until it fades away before reaching the anal angle.

### *Gurelca chaochauensis* sp. nov.

Al. ant. long., ♂, 19 mm. Al. ant. lat., ♂, 8.5 mm. Marg. ext., ♂, 10 mm.

*Habitat.* — Chao-chau, eastern China. One male in coll. B. Preston Clark, received from Dr. R. Luck and B. Gehlen.

Most nearly resembling *G. masuriensis sangaica* Butler, but easily distinguished by yellow stigma on fore wing, and bluish white irroration on various parts of the body and upper surface of the wings.

Antennae, brown, upper quarter light gray but black apically. Palpi, head, thorax and abdomen above, reddish brown. The hairs tipped with bluish white, give an irrorated effect to the head and prothorax. Mesothoracic tegulae edged with bluish white. Abdomen above sparsely irrorated with this same color. Legs and abdomen beneath warm reddish brown with bright yellow prominent lateral dots.

Fore wing above: Variegated, ground tone dark brown; a small light yellow stigma; a semicircular basal area, with its base 4 mm. in length on costal margin, lighter in tone because irrorated with bluish white; a median band extends narrowly and faintly from near the costal margin to the hinder margin, narrowing at M2; an area extending from a point on costal margin 8 mm. from wing apex to R3 on distal margin, is irrorated with bluish white, with oblique bands. A roughly rectangular area about 4 mm. square, lying between R3 and inner margin, is irrorated with reddish brown. Hind wing above, light yellow with dark distal border narrowing anteriorly to a width of 3 mm. and to a blunt point at anal angle.

Fore wing beneath: Basal half brown, this color extending costally to the irregular distal margin, and heavily along all the veins to this distal margin; inner margin light yellow; postmedian area between the veins yellow irrorated with rusty red to the distal margin; prominent bluish

white costal patch, 1.5 mm. in width, commencing at a point 4 mm. from wing tip; a similar faint shade 7 mm. from wing tip on costal margin; irregular distal margin brown irrorated with bluish white scales. Hind wing beneath, yellow irrorated with rusty red scales; two bluish white patches similar to those of fore wing, but fainter; distal margin brown, irrorated with bluish white.

### *Macroglossum doddi* sp. nov.

Al. ant. long., ♀, 22 mm. Al. ant. lat., ♀, 9 mm. Marg. ext., ♀, 13 mm.

*Habitat.* — Kuranda, northern Queensland. One female in coll. B. Preston Clark, collected by Mr. F. P. Dodd, and named after him.

A beautiful and highly variegated species, allied to *M. dohertyi* Roth. (1894).

Antennae dark brown. Palpus, first segment white, continuing to a point through the second segment; the rest of second segment dark mummy-brown; third segment lighter brown. Head and thorax wood-brown, with mesial stripe; mesothoracic and side tegulae rich dark mummy-brown, both bordered with wood-brown. Abdomen above, dark mummy-brown; yellow side spot on third segment, traces of yellow on second segment; mesial and lateral wood-brown spots on each segment, bordered with light pinkish cinnamon. Breast white, dark mummy-brown laterally. Abdomen beneath, dark mummy-brown, with a broad mesial white band extending to third segment, where it narrows abruptly, and continues narrow to the anus; segments bordered with white; side tufts white. Cilia of both wings, above and beneath, mummy-brown.

Fore wing above. Rich dark mummy-brown; a small white basal dot; a faint narrow sub-basal pale pinkish cinnamon line extends from a point 3 mm. distant from the base of the wing, on costal margin, obliquely basad toward inner margin, which it does not quite reach. The two narrow sharply defined bands peculiar to *M. dohertyi* are present, the median one is pale pinkish buff, while the postmedian one is light pinkish cinnamon; the postmedian line consists of a series of lunules, convex basally, while the line as a whole is evenly curved, and convex distally. In both these respects it differs markedly from the similar band of *M. dohertyi*, which ('Novitates Zoologicae,' Vol. I, Pl. V, fig. 2) is continuous in outline, and slightly S-shaped in form. Another drawing, made for me, of the type, confirms this figure in the 'Novitates.' Posteriorly of this line is a mummy-brown band 2 mm. wide at the hinder angle, and filling the area



to it. This band narrows costally to a width of 1 mm. on R1, where it broadens abruptly, and continues to the apex, narrowing again on SC5. The triangular area between this line, R1, and the distal margin, is irrorated with pinkish white scales, while the area between R1 and the costal margin is similarly irrorated, and contains within itself a subapical pinkish patch. Hind wing above dark mummy-brown at base and postmedially. The clearly defined bright yellow band is similar in width and shape to that of *M. dohertyi*.

Fore wing beneath, dull brown with pink scaling along the edge of the irregular distal marginal band, which is broadest on R2, where it attains a width of 4 mm., and is irrorated with white. Hind wing beneath, dull brown irrorated with gray. Abdominal area yellow, sharply cut off at anal angle. Three indistinct bands, one antemedian, one postmedian, and one submarginal, are of a darker brown tone.

### *Macroglossum haslami* sp. nov.

Al. ant. long, ♀, 27 mm. Al. ant. lat., ♀, 11 mm. Marg. ext., ♀, 15 mm.

*Habitat.* — Manila, Philippine Islands. One female in coll. B. Preston Clark, taken by my friend Mr. Greville Haslam, and named after him.

Most nearly resembling *M. passalus rectifascia*, but differing from it in the following respects.

The median thoracic stripe is broader in this form, and the area between it and the mesothoracic tegulae is light in color, causing a sharp contrast. The abdominal tufts all are yellow, none white.

Fore wing above: The portion basad of the antemedian band is so nearly of the same dark tint as to give the impression of a solid basal area. This antemedian band is distinctly convex distally. The area which in *M. p. rectifascia* extends from the apex along the costal margin 10 mm., is much less marked in this form. A gray distal marginal border, 2 mm. wide at the wing apex, broadens to 3.5 mm. on R2, and then narrows to a point at the hinder angle.

Hind wing above: The yellow median band is slightly narrower than in *M. p. rectifascia*.



The fore and hind wings beneath are similar to those of *M. p. rectifascia*, but the lines are slightly fainter.

*Xylophanes germen brevis* subsp. nov.

Al. ant. long., ♂, 27 mm. Al. ant. lat., ♂, 13.5 mm. Marg. ext., ♂, 18 mm.

*Habitat* unknown. Two males in coll. B. Preston Clark, received from Dr. O. Staudinger and A. Bang-Haas. Unfortunately I cannot ascertain the locality whence they came.

The genitalia of these specimens are identical with those of *X. g. germen*. In general coloration and maculation this form is close to *germen*. It is, however, a shorter-winged insect, and the width of the fore wing is greater in proportion to the length than in the typical form, producing the impression of a really different wing form.

The dark markings of the fore wing stand out in sharper contrast to the ground tone than in *germen*. The median geminate lunulate line which occurs in *germen* with greater or less distinctness, is sharply marked in *brevis*, and starting from a point 1 mm. distant from the hinder angle on the inner margin there runs a similar geminate lunulate line diverging from the distal margin and joining the median line midway between the inner and the costal margins. There is thus formed a triangle with its base on the inner margin. This occurs uniformly on both specimens of *brevis*, and I do not find it on any of my considerable series of *germen*. A faint trace of a line on one specimen of *germen* runs parallel to the distal margin, and not at an angle to it as in *brevis*.

The shortened fore wing, its sharp markings, and the angled geminate line, are the three outstanding characteristics of this subspecies, of which at some time I hope to know the locality.

**Xylophanes macasensis** sp. nov.

Al. ant. long., ♂, 40 mm. Al. ant. lat., ♂, 16 mm. Marg. ext., ♂, 23 mm.

*Habitat.* — Macas, Ecuador. One male in coll. B. Preston Clark, received from Dr. O. Staudinger and A. Bang-Haas.

Allied to *X. ockendeni* Roth.

Antennae brown above, white beneath. Palpi light yellow, shading darker at the tips. Head, thorax, and abdomen above, yellowish olive. Abdominal tergites with two mesial rows of dark dots. Abdomen light yellow beneath.

Fore wing above: Yellowish olive like thorax, with the three black patches of *X. ockendeni*, 3 to 5 mm. in diameter, one sub-basal, the second just beyond apex of cell, and the third at hinder margin proximally of angle. A small black stigma. A thin black line from outer side of sub-basal patch to costal edge, curved and irregular. An indistinct black bar in middle of cell. Two faint dentate lines, both dark yellowish green, distally of second patch, extend from midway of the inner margin to SC5, where they merge into two black lines extending from SC5 to costal margin. These black lines, angled basad at SC5, reach the costal margin 12 mm. and 9 mm. from the wing tip. A black dot on costal margin 7 mm. from wing tip. A dark green line extends from the inner margin, at a point 10 mm. from the hinder angle, to the wing tip, curving distally and becoming heavier as it approaches that point. A series of dark vein dots 2 to 3 mm. distant from distal margin. The distal margin evenly convex, except for a slight concavity posterior to the wing tip, resulting in a sharper point than in *X. ockendeni*. Fringe yellowish olive, dark at veins.

Hind wing above: Brownish black. An ill-defined pinkish band on disc, ending posteriorly in a patch of the same color. Distal edge narrowly bordered with yellowish olive. Fringe white, with a dark dot at the end of each vein.

The under side is similar in pattern to *X. zurcheri* Druce.

Fore wing below: Basal third brownish black; the rest of wing yellow, blotched with orange, and irrorated with longitudinal transverse black dots. An irregular clay-colored distal band, broadest between R1 and R2, where it is 8 mm. in width, extends from wing tip to hinder angle. An irregular dark brown line extends from the median point of the inner margin, curving basad at SC5 to the costal margin, which it reaches 12 mm. from the wing apex. A similar faint line extends from a point on costal margin 9 mm. from apex to SC5, and then faintly to R2. A dark brown line extends from

a point 7 mm. from the apex half-way to SC5. A series of vein dots follows the postmedian line on the upper side of the wing.

Hind wing below: Yellow, faintly tinged with orange, and irrorated with black transverse dots as on fore wing. Irregular clay-colored distal marginal band, as in *X. zurcheri*, broadest between R2 and R3, where it attains a width of 4 mm.; it is bordered with black basally. A dark brown S-shaped median line extends from anal angle to inner margin, curving first basad, then distally, and lastly basad. Midway between this line and the distal margin is a series of dark vein dots formed by a thickening of the transverse irrorations.

### *Xylophanes crotonis zikani* subsp. nov.

Al. ant. long., ♂, 35 mm.; ♀, 36, mm. Al. ant. lat., ♂, 12 mm.; ♀, 13 mm. Marg. ext., ♂, 20 mm.; ♀, 21 mm.

*Habitat.* — Passo Quatro, Minas Geraes, southern Brazil. Two males and one female in coll. B. Preston Clark, one male and one female in coll. Z. J. Zikan. Received from Mr. J. F. Zikan, and named after him.

This southern form of *X. crotonis* is smaller than either *X. crotonis crotonis* or *X. crotonis aristor*. Its ground tone is brighter green than in the latter, which in other respects it resembles more closely than it does *crotonis*. The transverse lines of the fore wing are well defined, as in *aristor*, the first and the fourth lines being heavier and broader than the rest. All these lines are straighter than in *aristor*. The thoracic patagiae are whiter than in *aristor*, the pink tinge being less marked.

There is a marked difference in the black basal area on the under side of the fore wing. In *aristor* this area extends heavily two thirds the distance to the wing tip along the costal margin, and to a point but 6 mm. distant from the hinder angle on the inner margin. In *zikani* this area becomes faint on the costal margin half-way to the wing tip, and on the inner margin extends barely half-way to the hinder angle. The posterior margin of this black basal area in *zikani* is straight from costal to inner margin, while in *aristor* the posterior margin is convex, turning sharply toward the hinder angle as it approaches the inner margin.

**Celerio hippophaës caucasica** subsp. nov.

Al. ant. long., ♂, 32 mm. Al. ant. lat., ♂, 13 mm. Marg. ext., ♂, 18 mm.

*Habitat.* — Aresch, Caucasus. Two males in coll. B. Preston Clark, received from Dr. O. Staudinger and A. Bang-Haas.

This form is intermediate between the European *C. hippophaës hippophaës* and the Far-Eastern *C. hippophaës bienerti*. I have been unable to find it described, and am therefore recording it.

In both coloration and maculation, throughout, the intermediate character of this form impresses one. In length of wing it is closer to *bienerti*. The portion of the fore wing above, basad of the dark brown postmedian transverse band, is light yellow, as in *bienerti*, though less markedly so. The abdomen above is nearly as dark as in *hippophaës*. The black distal submarginal band on upper side of the hind wing is heavier than in *bienerti*, being closer to *hippophaës*. The coloration of both wings below is between that of *hippophaës* and *bienerti*, but closer to the latter form.

**Hippotion beddoesii** sp. nov.

Al. ant. long., ♀, 35 mm. Al. ant. lat., ♀, 13 mm. Marg. ext., ♀, 19 mm.

*Habitat.* — Suva, Fiji. One female in coll. B. Preston Clark, collected by Mr. Percy Beddoes.

A beautiful and clearly marked species, resembling most nearly *H. velox* ab. *lifuensis* Roth. The silvery lines present in so many species of *Hippotion* are entirely lacking.

Antennae gray. First and second segments of the palpi white, third segment grayish green. Head gray, with light pink lateral lines, extending only back of the eye. Thorax and abdomen above, gray. Mesothoracic

tegulae tipped with pink. No white side tufts as in *H. velox* Fabr. Fourth, fifth and sixth segments of abdominal tergites with small pink lateral dots. Legs and abdomen beneath light gray.

Fore wing above: Uniformly gray. Small distinct black stigma. A wavy S-shaped postmedian line, accentuated with vein dots, extends from a point on SC5, 7.5 mm. distant from the distal margin, to a point on SM2 midway between the base and the hinder angle. Three faint lines run posteriorly of the postmedian one, and roughly parallel to it, from SC5 to the inner margin, but diverging from it as they approach the inner margin. A heavy dark brown line extends from wing apex to R2, growing lighter in color as it approaches that point. A fifth and a sixth faint line, the fifth accentuated by vein dots, extend from the two sides of the heavy apical line from R2 to M2, where they merge into a dark brown triangular area extending from the inner angle 8 mm. toward the base. A seventh faint submarginal line, accentuated by vein dots, extends from the wing tip to SM2.

Hind wing above: Light brown. A heavy dark brown submarginal line, lunulate between the veins, extends from anal angle to the inner angle, growing fainter costally. Basad of this line is a diffuse pink band, 2 mm. in width. The area between the submarginal line and the distal margin is lighter brown in tone than the rest of the wing. The wing as a whole is very similar to that of *H. velox* ab. *rosea* Roth.

Fore wing beneath: Basal half dark brown, as is the irregular distal marginal border. This latter, starting at the wing tip, widens irregularly to R2, where it attains a width of 6 mm; thence it narrows gradually to the inner margin, where it is 2.5 mm. in width. Basad of the distal marginal border the wing is pink, irrorated with dark transverse dots, sharply contrasting with the border. This pink area fades away basally at about the median portion of the wing.

Hind wing beneath: Dull pink irrorated with dark transverse dots postmedially. A dark brown distal marginal border is 2.5 mm. in width at the inner angle, and narrows irregularly to the anal angle, where it disappears.

### *Hippotion joiceyi* sp. nov.

Al. ant. long., ♂, 30 mm. Al. ant. lat., ♂, 11.5 mm. Marg. ext., ♂, 16.5 mm.

*Habitat.* — Nomnagihe, twenty-five miles south of Wangaar, Dutch New Guinea, 2000 ft. altitude. Two males, one of them the type, in coll. B. Preston Clark, taken by C. F. and J. Pratt, January and February, 1921, presented to me by my friend Mr. J. J. Joicey, of the Hill Museum, England. One male, a cotype, in the Hill Museum.

This form is allied to *H. brennus*, but is darker-colored and more uniformly colored.

The antennae, palpi, head and thorax are of the identical dark brown color of *H. brennus*. There are the same light side stripes and the same light mesial thoracic line. The abdomen above is of the same light brown color, but is unicolorous, lacking the white side tufts so prominent in *H. brennus*. The legs and abdomen beneath follow closely the coloration of *H. brennus*.

Fore wing above: A light brown basal area extends to the median point of the costal margin, and to a point on the inner margin 6 mm. distant from the base, or one third the distance toward the hinder angle. Within this light area are two faint lines, curved distad and extending from points on the costal margin 5 mm. and 8 mm. distant from the base to M2, where they disappear. The entire remaining area of the wing is dark brown; the line separating the light basal area from this darker distal portion runs straight from inner to costal margin, slightly extended basad between R3 and M1, and curving slightly basad as it approaches the costal margin. The dark brown color of the postmedian area becomes gradually lighter toward the distal margin. Within this dark area is a faint geminate line extending from the median point of the inner margin toward a point 8 mm. distant from the wing apex on the costal margin; it fades away, however, at SC5. This line is faintly curved, first distad and then basad. Distally from this line, parallel to it, and distant 1.5 mm., a line extends from the inner to the costal margin, which it reaches at a point 5 mm. from the apex, curving basad before reaching it. This line is sagittate at the veins, the points being distad. Posteriorly of this sagittate line is a darker band extending narrowly from the wing apex, and broadening as it approaches the inner margin, until it fills the full space between the sagittate line and the hinder angle, to which it broadens sharply between M2 and SM2. The submarginal area between this band and the distal margin again is lighter in color, and within this area a submarginal row of vein dots occurs, accentuating a line lunulate between the veins, the lunules being convex basad.

Fore wing beneath: Reddish ferruginous, irrorated with black. A dark postmedian line extends from a point on the costal margin 11 mm. distant from the apex to the median point of the inner margin, curving first slightly distad and then basad; it is similar to the line of *H. brennus*, but curves less basad as it approaches the costal margin. A faint angled line, 2 mm. distant distad from this postdiscal line, extends from the costal margin to R3. There is a series of vein dots on veins SC5 to M1, inclusive, midway between the postmedian line and the distal margin. A brown marginal band, similar to that of *H. brennus*, is broadest on R2, where it attains a width of 4 mm.; the contrast in color between this band and the remaining portion of the wing is less marked than in *H. brennus*.



Hind wing above: A dark brown distal marginal band, 1 mm. in width at the anal angle, broadens evenly until at the apex of wing it is 3 mm. broad. Basad of this area the wing is crossed by a narrow dull pink band, the veins however being darkly extended through this area as well as through the marginal band. This dull pink band fades away basad to the dark brown tone of the fore wing above.

Hind wing beneath: Reddish ferruginous, irrorated with black. A dark median line extends from the median point of the inner margin toward the anal margin, but fades away before reaching it. Midway between this line and the distal margin are a series of vein dots. Another faint series of vein dots lies midway between the median line and the heavier series. A brown marginal band follows the line of the hind wing above.

### *Theretra manilae* sp. nov.

Al. ant. long., ♀, 35 mm. Al. ant. lat., ♀, 14 mm. Marg. ext., ♀, 19 mm.

*Habitat.* — Manila, Philippine Islands. One female in coll. B. Preston Clark, received from Mr. E. Le Moulton.

Allied to *T. rhesus* Boisd., but much smaller and brighter green.

Antennae brown. Palpus light gray, with sparse black-tipped hairs; second and third segments dull green. Head, thorax and abdomen above, olive green, the latter shading to pink posteriorly (probably discolored!). A light pink side stripe, bordered with green, extends along the eye and back to the base of the abdomen. Mesothoracic tegulae tipped with light yellow. A dark median stripe and two lateral stripes on the abdomen above. Legs green. Breast and abdomen below light pinkish, thinly irrorated with black scales.

Fore wing above: Olive green. Minute black stigma, smaller than in *T. rhesus* Boisd. The six dark olive green lines are placed identically with those of *T. rhesus*, except that the first antemedian line is straighter, and approaches the inner margin more abruptly. The first and fourth lines are heavier than the rest, while the sixth, the posterior one, is accentuated by vein dots.

Hind wing above: Burnt umber, unicolorous, save for a faint and ill-defined dull pink submarginal band extending from anal angle toward the costal margin but fading away before reaching it.



Fore wing below: Basal half dull brown, this color narrowing posteriorly, and continuing along the inner margin to the hinder angle, being continuous with the distal marginal band. This latter band, starting at the wing tip, widens regularly to a point between R2 and R3, where it is 4.5 mm. in width; it then narrows abruptly to 3 mm. on R3, and continues to the hinder angle, where it is 2.5 mm. in width. From the wing tip to its widest portion this band is dull gray, bordered basally by a brown line; posteriorly of this point it is dull pink red. The area between the distal marginal band and the dark basal area is dull pink red, irrorated with black dots. There are two subapical costal dots 4 mm. and 6 mm. from the wing tip. A narrow dark median line extends from a point slightly basad of the centre of the inner margin, obliquely, faintly, and somewhat interruptedly, to the basal one of the two costal subapical dots. A second narrow line, accentuated at the veins, extends roughly parallel to the median one, from a point on the costal margin 2 mm. distant from the wing apex to a point on the inner margin 7 mm. distant from the hinder angle.

Hind wing below: Dull pinkish red, irrorated with black dots, clothed with long gray hairs along the anal margin. A dark median S-shaped line extends from the costal to the anal margin. A broader postmedian dark line, heavily accentuated at the veins, extends from the hinder angle to the costal margin, turning basad as it approaches the latter. A dark distal marginal band, 2.5 mm. in width at the wing apex, tapers to a point at the hinder angle.